ABSTRACT:

It is evident that the carbon-fiber-reinforced cementitious composites are being used in the structural and construction works owing to the synergetic action from two components viz. fiber and mortar matrix. Incorporation of a very nominal percentage of carbonfibers into a mortar mixture produces a strong and durable composite that leads the product of smart material properties. Flexural behavior of cement-based matrices carrying carbonfibers reinforcement of different percentage and size is studied in this paper. Influence of fiber content and length of the fiber is quantified using load–deflection curves. Specimens containing fiber of 0.0, 0.5, 1.0 and 1.5% with 3 mm (0.12 in.), 6 mm (0.36 in.), and their combination are prepared and tested. It is demonstrated that combination of 3 mm (0.12 in.) and 6 mm (0.36 in.) fibers enhances the bearing capacity to crack- and ultimate-stresses as well as the Young's modulus of the fiber reinforced cementcomposites. The paper emphasizes the desired performances after the initiation of cracks and discusses the pre- and post-cracking load–deflection characteristics of the composites.